Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.-10. (cancelled)

11. (previously presented) A method for transmitting a first and a second data signal in polarization multiplex in an optical transmission system, the method comprising:

modulating at the transmitting end the first data signal onto a sideband of a first carrier signal to generate a first sideband modulated signal;

modulating at the transmitting end the second data signal onto a sideband of a second carrier signal to generate a second sideband modulated signal;

orthogonally polarizing the first and the second sideband modulated signals to each other;

combining the first and the second sideband modulated signals into a optical multiplex signal;

transmitting the optical multiplex signal;

feeding at the receiving end the optical multiplex signal via a polarization control element to a polarization splitter which separates out the optical multiplexed signal which was transmitted into the first and second modulated signals;

converting the first sideband modulated signal to a first electrical signal and/or converting the second sideband modulated signal to a second electrical signal;

analyzing the first and/or the second electrical signal; and

dependent on the analyzing result, deriving at least one control signal for the purpose of controlling the polarization control element.

12. (previously presented) The method according to Claim 11, wherein the sideband modulation is effected using carrier signals which have the same frequency.

13. (previously presented) The method according to Claim 11, wherein the sideband modulation is effected using carrier signals which differ by a differential frequency (Δf) such

that the spectra of the first and the second sideband modulated signals overlap, by which means the transmission bandwidth is reduced.

14. (previously presented) The method according to Claim 13, wherein the differential frequency (Δf) is greater than one Gigaherz.

15. (previously presented) The method according to Claim 12, wherein the sideband modulation is a single sideband modulation or a vestigial sideband modulation.

16. (previously presented) The method according to Claim 13, wherein the sideband modulation is a single sideband modulation or a vestigial sideband modulation.

17. (previously presented) The method according to Claim 13, wherein for a second carrier signal which differs from the first carrier signal by a differential frequency (Δf) the spectral component of the first and/or the second electrical signal is determined at the differential frequency (Δf) for the purpose of analyzing the first and/or the second electrical signal.

18. (previously presented) The method according to Claim 17, wherein the amplitude of the first and/or the second electrical signal is controlled to a minimum at the differential frequency (Δf).

19. (previously presented) The method according to Claim 11, wherein the first or second sideband modulated signal is delayed at the transmitting end for the purpose of decorrelation.

20. (previously presented) The method according to Claim 12, wherein the first or second sideband modulated signal is delayed at the transmitting end for the purpose of decorrelation.

21. (previously presented) The method according to Claim 13, wherein the first or second sideband modulated signal is delayed at the transmitting end for the purpose of decorrelation.

22. (previously presented) The method according to Claim 14, wherein the first or second sideband modulated signal is delayed at the transmitting end for the purpose of decorrelation.

23. (previously presented) The method according to Claim 15, wherein the first or second sideband modulated signal is delayed at the transmitting end for the purpose of decorrelation.

24. (previously presented) The method according to Claim 11, wherein for the purpose of distinguishing the first and second electrical signals, at least one pilot tone signal is superimposed at the transmitting end on the first and/or the second carrier signal or the sideband modulated signal.

25. (previously presented) The method according to Claim 12, wherein for the purpose of distinguishing the first and second electrical signals, at least one pilot tone signal is superimposed at the transmitting end on the first and/or the second carrier signal or the sideband modulated signal.

26. (previously presented) The method according to Claim 13, wherein for the purpose of distinguishing the first and second electrical signals, at least one pilot tone signal is superimposed at the transmitting end on the first and/or the second carrier signal or the sideband modulated signal.

27. (previously presented) The method according to Claim 14, wherein for the purpose of distinguishing the first and second electrical signals, at least one pilot tone signal is superimposed at the transmitting end on the first and/or the second carrier signal or the sideband modulated signal.

28. (previously presented) The method according to Claim 11, wherein for the purpose of distinguishing the first and second electrical signals the first and second data signals are transmitted at different bit transmission rates.

29. (previously presented) The method according to Claim 11, wherein for the purpose of distinguishing the first and second electrical signals the first and second data signals are transmitted in different data formats.

30. (previously presented) The method according to Claim 11, wherein the optical transmission system is operated in wavelength multiplex mode.